

NOTHANGUINA PHYLLOBIA
A NEMATODE PEST OF A NOXIOUS WEED SOLANUM ELAEAGNIFOLIUM

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Phytoparasitic nematodes are rarely considered as agents in biological control of a pest plant. Nothanguina phyllobia Thorne (fig. 1) is a severe parasite of silver-leaf nightshade (Solanum elaeagnifolium Cav.) and has the potential to exert a biological control effect on the weed. Silver-leaf nightshade occurs in Florida but to our knowledge not the nematode.

HISTORY: Thorne 1934 described the nematode placing it in the genus Anguina. In 1961 he assigned it to the genus Nothanguina.

ECONOMICS: Silver-leaf nightshade is considered one of the most important weed species in Africa, Australia, and South America as well as in its area of distribution in the United States where over 1.2 million hectares of cropland are infested. It is associated with yield reduction in cotton and in sorghum.

DISTRIBUTION: The nematode is known from Arizona and Texas. The weed host is found from Mexico and Texas to Florida and Missouri. It is also found in Ohio and Indiana.

HABITAT: Silver-leaf nightshade is found in dry open woods, prairie, waste areas, ditch banks, and disturbed soil. It is a weed pest in cotton fields. The nematodes are most abundant in the soil very near the surface but have been found 33 cm deep.

SYMPTOMS: The weed leafs out in late March and early April. As plants mature a slight thickening and toughening of leaves become evident. In early stages of infection small emerged leaves are crinkled and thickened. About 2 weeks following infection the leaf is distorted abnormally (fig. 2). After about 6 weeks leaf necrosis occurs.

Flowers and fruit sets are reduced, and leaves and fruiting structures abscise. Severely infected plants are stunted, and some are killed. Galled leaves appear throughout the growing season. Rein-festation occurs when weather conditions favor new plant growth.

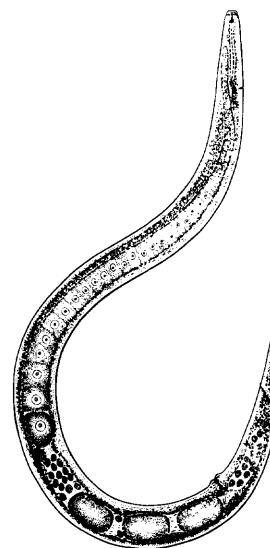


Fig. 1. A female of Nothanguina phyllobia. (After Thorne)



Fig. 2. Leaf distortion of Solanum elaeagnifolium caused by Nothanguina phyllobia. (After C. Orr)

HOST LIST: No other hosts are known. Host tests with the nematode using potato, tomato, okra, cotton, pigweed, devilsclaw, and buffalo bur were negative.

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PARASITISM: Nematodes occupy the leaf (fig. 3) and hollow areas in leaf center.



Fig. 3. Nothanguina phyllobia inside leaf tissue of Solanum elaeagnifolium. (After Orr)

DISPERSAL: Nematodes are dispersed by irrigation and rainwaters, wind, dust, and water-moved soil. Nematodes ascend host stems at a rate of 15 cm in a few hours.

BIOLOGICAL CONTROL IMPORTANCE: Herbicides used for annual weeds do not control silver-leaf nightshade. Since the nematode is host specific and is not known to pose a threat to cultivated crops, its use in a biological control program appears very promising. In heavily infested soil 50% of the infected plants have been killed each year, and growth and reproduction of the surviving plants were reduced 50%.

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